

CLAIMS

1. An electrical transformer comprising:  
5 -a tank (1) containing transformer fluid (2);  
-a transformer core and winding subassembly (3) disposed in said transformer fluid (2) within and spaced apart from said tank (2);  
-active means for varying the volume of said transformer fluid (2) in order to reduce pressure waves (4) generated by the vibration of said core and winding subassembly (3) during electromagnetic operation, said active means being disposed in said transformer fluid (2) within said tank (1);  
characterised in that said active means comprise at least a cell (5) having:  
10 -a main body (20) and a corrugated membrane (21) operatively connected to said main body (20) in order to realise a sealed container able to maintain a low pressure atmosphere (28) inside;  
15 -actuating means (24) placed inside said sealed container and solidly connected to said corrugated membrane (21).  
2. An electrical transformer as in claim 1 characterised in that it comprises elastic means (23) placed inside said cell (5), operatively connecting said corrugated membrane (21) and said main body (20).  
20  
*subm7*  
3. An electrical transformer as in claim 1 or 2 characterised in that said actuating means (24) comprise one or more piezoelectric stack elements (25).  
4. An electrical transformer as in one or more of the previous claims characterised in that said actuating means (24) are connected to controlling means (6) placed 25 outside said tank (1).  
5. An electrical transformer as in claim 4 characterised in that said controlling means (6) are connected to detection means (7) for detecting pressure waves (4) generated by the vibration of said core and winding subassembly during electromagnetic operation and transmitting a signal (100) indicative of the amplitude and frequency of said pressure waves (4) to said controlling means (6).  
30  
6. An electrical transformer as in claim 5 characterised in that said detection means (7) are placed inside the tank (1) of said transformer.

AMENDED SHEET

EMPFANGSZEIT 6. FEB. 16:58

AUSDRUCKSZEIT 6. FEB. 16:58

7. An electrical transformer as in claim 5 characterised in that said detection means (7) are placed outside the tank (1) of said transformer.
8. An electrical transformer as in claims 7 characterised in that said detection means (7) comprise one or more transducers (9) for detecting the vibrations of said tank (1) generated by said pressure waves (4).
- 5 9. An electrical transformer as in claim 6 characterised in that said detection means (7) comprise one or more pressure transducers (8).
- 10 10. Method for reducing pressure waves generated by the vibration of said core and winding subassembly (3) during electromagnetic operation of an electrical transformer as in one or more of the previous claims, characterised in that it comprises the following steps:
  - detecting pressure waves (4) generated by the vibration of said core and winding subassembly (3) of said electrical transformer during electromagnetic operation;
  - transmitting signals (100), indicative of amplitude and frequency of said pressure waves (4), to said controlling means (6);
  - 15 -analysing the signal (100) transmitted by said detection means (7) and transmitting signals (101) for driving said actuating means (24) comprised in each of said cells (5);
  - generating, through the vibration of the corrugated membrane (21) of each of said cells, transformer fluid pressure waves (40), varying in amplitude and frequency, able to regulate the volume of said transformer fluid (2).
- 20 11. An active device (5), for regulating the volume of a fluid (2) in which said device (5) is disposed, through the generation of fluid pressure waves (40) varying in amplitude and frequency, characterised in that it comprises:
  - a main body (20) and a corrugated membrane (21) operatively connected to said main body (20) in order to realise a sealed container able to maintain a low pressure atmosphere (28) inside;
  - actuating means (24) placed inside said sealed container and solidly connected to said corrugated membrane (21).